PROJECT MANGEMENT PLAN EXAMPLES

Prepare Project Support Plans and Documentation - System Closure Plan Examples

Example 61

7.5 Endpoint Closure

The endpoint documents have grouped the building spaces and systems into a number of manageable areas. The areas are closely related to the engineering work plans that guide completion of many of the endpoints. Endpoint closure methods and practices are provided in the attachment of this PMP.

On completion of an endpoint, a BWHC field representative will initial complete on the field copy of the endpoint document. A BHI field representative will verify acceptable completion of the applicable activity. Verification may be performed by reviewing documents, letters, photos, work packages, or work plans, or by visual inspection. When all the endpoints for a specific area of the building have been completed and verified, designated BWHC and BHI management will sign for completion and acceptance of that area. A filing system will be utilized for storing the documentation closing endpoints.

7.6 Administrative Endpoints and Turnover Package

Administrative endpoints are a compilation of identified supporting documentation for the transition of the 324 and 327 Buildings into the Surplus Facilities Program. An endpoint has been assigned to the documents for tracking and verification only. The compilation includes those documents that are required by law, the Tri-Party Agreement, or DOE Orders, or have been identified by building management, RL, or BHI.

Additional supporting documentation is included under the requirements of a turnover package. The turnover package activities support the physical 'hands on' documentation required to perform future surveillance entries and audits and to assist disposition planning (e.g., final Radiological Surveys and maps). Turnover package items are addressed in the endpoints for the specific space or system where the requirement applies. A turnover package consists of the following items:

- Essential diagram drawings required to support S&M and D&D
- Certified vendor information
- Chemical and hazardous substance inventory
- Deactivation work plans
- Description/photos of spaces to be routinely surveyed
- Final radiological surveys and maps
- RCT routine
- Industrial space hazards identified
- Operational systems waste accumulation areas identified
- Structural and roof studies
- Fire hazard analysis requirements
- Compliance with the Hazards Communication Program
- Compliance with the Asbestos Control Program
- Compliance with the Confined Space Program
- Waste characterization data for waste that was removed as a part of deactivation.

Example 62

7.4 END POINT ADMINISTRATION AND CLOSURE

Completion and verification of the 9206 Complex end points by EUO 9206 staff and the organization who will be responsible for the S&M phase, if different from EUO, is required to complete the facility transition phase and initiate the S&M phase of the decommissioning process. A transition readiness review will be performed and documented to verify that the facility is acceptable for long-term S&M. The readiness review will follow the approach used at other DOE sites for facilities being turned over for acceptance into the EM program. (NOTE- At the current time it is expected that 9206 Complex will continue to be managed by EUO under the Y-12 Defense Programs during the S&M phase. The document will describe the final facility condition including environmental, safety, nuclear material holdup, and outstanding regulatory concerns.)

On completion of an end point, 9206 staff will review completion on the field copy of the end point document and then verify acceptable completion of the applicable activity. Verification may be performed by reviewing documents, letters, photos, work packages, or work plans or by visual inspection. When all the end points for a specific area of the facility have been completed,

9206 operating crews and supervision will verify and document completion of that area. A filing system will be required for storing the documentation for closing end points. The end point document groups the facility spaces and systems into a number of manageable areas. These areas are closely related to the work plans that will guide completion of many of the end points. (See Fig. 8.1) Activities that are conducted in FY-1999 prior to end points definition will be included in the document system.

7.5 ADMINISTRATIVE ENDPOINTS AND TURNOVER PACKAGE

Administrative end points are a compilation of identified supporting documentation for the deactivation and transition of Building 9206. An end point has been assigned to these for tracking and verification only. The compilation includes those documents that are required by law, DOE orders, or have been identified by the deactivation planning team, DOE, or LMES. The turnover package supports the physical "hands on" documentation required to perform future S&M entries and audits and to assist disposition planning (e.g. final radiological surveys and maps). Turnover package items will be addressed in the end points for the specific space or system where the requirements applies. The following information will be prepared as part of the turnover package:

- Security Plan for S&M Phase
- RCRA Closure Plans
- Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) (solid waste management unit) Closure Documentation (as applicable)
- Air Permit Status and Documentation
- CSA/Criticality Safety Requirements (CSR) Closure Status and Documentation
- Final Nuclear Material Inventory Status
- Essential Engineering Drawings Required to Support S&M and D&D
- 9206 Building Floor Plan(s)
- 9206 Building Equipment Drawings
- IH Sample Analysis (for example, asbestos)
- Chemical and Hazardous Substance Inventory (for example, HMIS reports)
- Industrial Space Hazards Identified (for example, low head space) FHA BIO
- Deficiency Reports for Equipment/Systems Remaining "As-Is" Until D&D.
- Deactivation Work Plans
- Final Radiological Area Surveys and Maps
- Radiological Survey Routine Plan for S&M Phase Structural and Roof Studies
- Preventive Maintenance Schedule (for systems to remain functional during S&M phase)
- Waste Accumulation Areas Identified for S&M Operational Systems
- End Point Closure Documentation
- Proposed S&M Route
- Draft S&M Plan
- Description/Photos of Spaces on S&M Route
- Compliance with the Asbestos Control and Confined Space Programs
- Waste Characterization Data for Egress Waste
- Justification for Change in Authorization Basis at Deactivation End State
- Safety Basis Document(s) for S&M Phase

Example 63

4 Project Approach

A number of strategies were used in the development of the 771/774 Closure Project scope, work logic, schedule performance, basis of estimates and costs. The strategies employed in the 771/774 Closure Project are similar to as those employed by the Site's Ten Year Planning Exercise, 'Accelerated Cleanup: Focus on 2006':

- Maintain the site's safety envelope ensuring the continued safety of site workers, the public and the environment during cleanup activities.
- Eliminate highest priority risks first. High priority risk activities primarily involve stabilization, consolidation, interim storage and shipment of SNM.
- Reduce the site's high nuclear facility baseline costs by accelerating closure of these facilities through expedited stabilization, consolidation and off-site shipment of SNM.
- Demolish site facilities and infrastructure to eliminate future funding and safety liabilities, ongoing maintenance and surveillance and residual radioactive material management.
- Clean up environmentally contaminated areas to the extent that sources of contamination that pose a significant risk are mitigated and controlled. Site cleanup is performed to the extent necessary to support the land uses described in RFCA and to ensure that downstream water quality standards are met.
- Reduce infrastructure and management costs at a steady pace throughout the life of the cleanup project.
- Comply with all applicable laws, regulations and agreements.

4.1 Strategic Project Phases

4.1.1 Integrated Approach to Closure

The 771/774 Closure Project supports the DOE Strategic plan by closing a major nuclear facility at RFETS.

The 771/774 Closure Project utilizes a more efficient approach to closure. This approach moves away from the sequential 'deactivation, decontamination and decommissioning' in series and moves towards a well-integrated parallel approach where all three of these activities may occur at any time, simultaneously, within the facility. This approach is expected to be more cost-effective as it allows more work to be accomplished with fewer resources in less time. It also significantly reduces exposure of the workers to hazards. For example, in the typical series model, workers would perform radiological surveys and other necessary characterization activities, enter each glovebox and sweep down the box to remove holdup. Then, much later, the workers would return to that same box, redo the necessary radiological surveys, etc. and begin the removal process. Instead, by performing closure activities in parallel the team can simply perform the characterization activities once. The team can then complete the removal of holdup and the removal on the equipment immediately thereafter, thus eliminating the risk in a shorter time, with fewer resources, and less exposure.

The Closure Strategy Employs a Phased Approach

Activity Phase	[redacted]					
Typical Phase Endpoints	Removal of: SNM solids, liquids, residues, chemicals, idle equipment	Glovebox removal, duct remediation, process system removal	Radiation/ contamination zone reduction, hazardous material closure	Shutdown/ removal of: fire systems, ventilation electrical	Superstructure removal	Slabcapped
Hazard Category	Category 2	Category 3	Radiological Facility	Industrial Facility		
Safeguards Category	VII	III/IV	N/A			

Figure 4-1 Phased Approach to Closure

4.1.2 Phased Approach to Closure

The 771/774 Closure Project will utilize a phased approach to the closure of the associated facilities.

The following is an overview of the activities that occur in each of the phases and are described below in more detail: (Note: This DOP covers only project Phases I-IV, a future revision will cover Phase V).

Phase I Major Hazard Reduction

- Remove combustibles
- Disassemble and remove loose/free SNM to address criticality concerns
- Drain lines (process, steam, chemical, etc.)
- Drain liquid process tanks
- Remove equipment internal to gloveboxes
- Wipe down gloveboxes
- Waste characterization and disposal
- Reduce surveillances
- Isolate and contain material within the building that may migrate
- Remove stored SNM material
- Stabilize radiological contamination and seal gloveports
- Remove radiological contamination and stabilize Rm. 141

Phase II Equipment Dismantlement

- Remove process piping
- Remove process vessels
- Remove glovebox off-gas and ventilation ducting legs
- Ambient Air Monitoring in place
- Remove Zone I HVAC system
- Remove gloveboxes
- Remove hoods
- Remove process pumps

Phase III Building Decontamination

- Remove hazardous and radiological contamination to minimize hazardous/radioactive material dispersion during demolition and minimize waste disposal cost
- Remove non-load bearing walls to minimize waste disposal cost
- Remove remaining asbestos, lead, mercury, etc.

Phase IV Utility System Shutdown

- Isolate steam to facility
- Isolate water to facility
- Isolate sewer line
- Isolate and liquid effluent discharges
- Deactivate HVAC system
- Remove remaining HEPA filters
- Remove/reconfigure electrical switch gear
- Remove remaining operational system that supported previous phases
- Isolate fire system
- Remove accumulated waste and remaining office furniture
- Isolate pressurized air systems
- Isolate inert systems (N2, Ar) and 02 analyzers
- Isolate diesel generators, UPS, and grounding/lightning protection
- Deactivate criticality system
- Deactivate building chemical/gas support

Phase V Building Demolition

- Demolish building
- Monitor for releases during building demolition
- Disposal of rubble

Phase VI Site Remediation

- Monitor site for any environmental impacts
- Cap building slab to contain hazardous materials

Documentation - All Phases

- Documentation of End Points performance and completion
- Gathering and transfer of facility records for archive purposes

4.2 Enabling the Goals of Closure

A major piece of the overall closure strategy focuses around how equipment will be selected, prioritized and dispositioned in order to enable the goals of closure. The first step taken was to select the equipment groups or geographical areas that would be defined as worksets. This selection process resulted in 82 worksets being identified for the 771/774 Closure Project. These worksets were then evaluated using the criteria located in Appendix 3. Weighting factors were applied to the criteria in order to provide a preliminary prioritization of the worksets. This preliminary prioritization, combined with solid engineering judgment, enabled the project team to make informed decisions concerning the order in which equipment is removed from the cluster. A complete list of the worksets is located in Appendix 4.

It is important to understand however that this prioritization is not necessarily final, but rather will be used as a planning guide for activity order. Several issues may affect the order in which worksets are removed. Activities may be either delayed or brought forward based on budget, available resources and approval status. Flexibility in the actual completion of the work sets will allow a more efficient closure of the facilities. In no case will a lower priority activity be performed when ft is not safe or economical to do so. For example, the plenum removal (priority 67) would not be performed prior to the removal of the gloveboxes, as ft would not be safe to do so. This type of error would be prevented by the health and safety controls described in Section 5. Therefore, changing of priorities will not necessitate a resubmission of this document.

4.3 Determining project End Points

With the worksets selected and prioritized, specific end points were developed for each set. The individual sets and associated end points can be found in Appendix 9.

4.4 Characterization Approach

The 7711774 Closure Project requires that the physical, chemical and radiological condition of each workset be assessed. Characterization is the process of identifying what physical, chemical, biological and radiological hazards are associated with a workset and/or facility. The hazard may be contained (e.g., acid in a tank) or loose (e.g., radioactive material on a floor). The hazard may be potential (e.g., pressurized steam line) or immediate (e.g., a leaking pipe that contains radioactive material). Characterization is achieved through a combination of facility walkdowns (physical walkdowns), review of historical records,

information from similar buildings, interviews of personnel familiar with building operations, direct measurement, non destructive assay and sample collection for laboratory analysis. The characterization data will be utilized for assessing actual and potential hazards as a basis for the development of the technical approach to work activities, and to support the proper disposal of property and waste.

This section discusses the types and phases of characterization that have been and will be completed for the 771/774 Closure Project. The Data Quality Objectives (DQO) process will be utilized for the characterization activities as discussed below. Additionally, the Multi-Agency Radiation Survey and Site Investigation Manual (MARSSIM) will be adapted for the final surveys for this project. The Site's Decontamination and Decommissioning Characterization Protocols are being developed and are scheduled for implementation in December 1998. These Protocols, which include guidance on both the DQO process and MARSSIM, provide a consistent sampling and analysis process for characterization activities.

Scoping Characterization

The Scoping Characterization phase is the process of gathering information about facilities' hazards from existing sources. The main sources of this information are historical records, routine survey records, facility walkdowns and interviews with facility personnel and former facility personnel. Note that no additional sampling or surveys are necessary in this characterization phase. The compilation of this information is used as the basis for preliminary evaluations of proposed decommissioning activities. The Scoping Characterization phase feeds information into the Reconnaissance Characterization phase.

The 771/774 Closure Project's Scoping Characterization phase is complete. The documents that were reviewed in gathering this information are identified in the project files.

Reconnaissance Level Characterization

The Reconnaissance Level Characterization phase establishes a definitive baseline of information about the facility's hazards. The Reconnaissance Level Characterization Report (RLCR) describes the presence of materials and isotopes that will impact the closure of the 771/774 cluster. The importance of the presence of these items is based on both worker safety and waste disposal/regulatory concerns.

Each of the isotopes or materials has been identified through investigation of facility-related documents, walkdowns of the facility, a review of historical data and process knowledge. The RLCR may be used, as a basis to define the required sampling needed to support facility deactivation, decontamination and structural demolition. Additionally, the RLCR provides information to support ALARA (As Low As Reasonably Achievable) planning for the protection of the workers and environment. The RLCR also provides preliminary characterization data to be used for the preparation of work procedures. As discussed below, additional detailed characterization may be required. This RLCR for Building 771/774 was submitted on August 8, 1998.

Building 790 was recently added to the 771/774 cluster; the decommissioning work scope will be part of this project (added as workset 82). A RLCR has not been completed for the Type 1 and 2 buildings associated with this cluster, no decommissioning work will commence in these buildings before a RLCR is completed and submitted to the LRA.

In-Process Characterization

To supplement the Reconnaissance Characterization, additional radiological, chemical samples and safety surveys will be completed as necessary, to prepare appropriate work authorization documents such as Radiation Work Permits (RWP), a Job Hazard Analysis (JHA), and the Integrated Work Control Package. (See section 4.8) These job-planning surveys are performed in accordance with existing site procedures. If conditions have changed, reviews will be performed as appropriate to determine if other actions/controls are necessary. The Decontamination and Decommissioning Characterization Protocols do not cover these job-planning activities.

After all work sets are completed in an area and hazards are removed, further characterization may be performed to verify the effectiveness of the decommissioning work efforts. This continued sampling and surveying is called In-Process Characterization. This characterization will be conducted in accordance with the Decontamination and Decommissioning Characterization Protocols.

Final Building Survey

The Decommissioning Program Plan (DPP) requires that "at the end of the decommissioning, Site personnel will confirm that their activities have achieved the- release standard for buildings destined for reuse or the completion of building disposition for buildings that are demolished such that only environmental restoration activities remain."

Accordingly, the Final Building Survey is conducted to demonstrate that the radiological and industrial contaminants within the facility have been reduced to levels that comply with the established release, criteria. If unable to reach free-release criteria (see para 4.7.1), the building will be disposed of as LLW. A Sampling and Analysis plan, to be approved by the LRA, will be developed in accordance with the Decontamination and Decommissioning Characterization Protocols, it is intended to be utilized to execute the characterization of the remaining hazards on or below the slab. The plan will be included with the DPP revision for building demolition (see section 2). The Final Building Survey report will be included as part of the project's administrative record and turned over to the Contractor's Environmental Remediation Department for final site remediation.

Slab/Under Building Characteristics

This sampling and analysis will be conducted to characterize and rank the remaining building slab and under building contamination. The results of this survey will be used to prepare for environmental monitoring and remediation.

Independent Review of Final Building Survey

In order to verify that the facility meets established release criteria, an independent company will conduct a review of the Final Building Survey. DOE will approve the selection of the independent company. This independent review will not be conducted for material being released as LLW. The independent review provides an independent evaluation of the Final Building Survey methodology, survey data, field sampling and laboratory methods and results. All discrepancies and anomalies identified will be addressed.

Physical Characterization

Full physical walkdowns of the facility are being conducted to obtain the physical characterization of the facility. This includes dimensional data as well as physical details such as the amount of lead shielding, Benelex, number of High Efficiency Particulate Air (HEPA) filters, etc. It will also gather data concerning physical items contained within the equipment such as tools, pumps, vessels, etc.

4.4.1 Radiological/SNM Characterization

4.4.1.1 Radiological Contamination/Penetrating Radiation Characterization
The radiological characterization of the facility and equipment will make use of the existing operational radiation protection surveys supplemented by additional surveys to determine the presence and/or level of radiological contamination. The radiological monitoring of radiation exposure levels, contamination and airborne radioactivity will comply with the requirements of 10 CFR 835, RFETS Radiological Control Manual, NUREG 5849, 'Manual for Conducting Surveys in Support of License Termination, Decommissioning Characterization Protocols' and the site Radiological Control Manual and it's applicable procedures (i.e. Radiological Safety Practices). Trained and qualified personnel using instruments that are property calibrated and routinely tested for operability will perform the characterization surveys. Training requirements are specified in the Training Users Manual. The results of radiological surveys will typically be documented on a diagram. The documentation will contain sufficient detail to permit identification of original survey and sampling locations.

Using the facility operations and radiological history, sampling locations will be selected to quantify, radioactivity based on suspected or known contamination at a given location. Examples include horizontal surfaces such as the tops of gloveboxes and piping in overhead areas. Other random locations of unaffected areas mail be selected to confirm no radiological concerns exist. Examples of these include office areas and areas where radioactivity is not expected.

It is not intended to consider this characterization the final assessment by which worker protection and safety decisions will be made. Additional characterizations will be performed as required to prepare work authorization documents. This type of characterization will typically be performed shortly before work is initiated to ensure conditions have not changed and to more accurately assess those hazards. This characterization will be used to determine appropriate personal protective equipment to ensure worker health and safety.

4.4.1.2 SNM Holdup
Holdup is defined as the amount of nuclear material remaining in process equipment (e.g., gloveboxes, ventilation ducts) and facilities after the in-process material, stored materials and product are removed. Holdup has been found in Building 771 as oxides (Safeguards and Security attractiveness type C) or low- grade materials (type D).

To ensure the accuracy of the measurements determining the amount of remaining holdup, all background radiation sources (e.g., waste drums) will be removed from the area being measured. All packaged fissile material will be removed from the gloveboxes and a radiological survey conducted prior to the measurements. All measurement sites must be free of external radiological contamination to insure that measurement equipment is not contaminated and remains usable. Measurements are conducted in accordance with the approved site holdup measurement plan 4-81232-97-PLAN-HOLDUP-001, Revision 1 that will determine the types and quantities of isotopes present.

4.4.2 Chemical Characterization

The chemical characterization of the facility will make use of existing process knowledge supplemented by sample analysis. The characterization activities will:

- evaluate the chemical characteristics of hazardous material contamination
- assess the environmental parameters that affect potential human exposure from existing or residual chemical contamination
- support the preparation of work plans to enhance safety of the worker
- allow for estimation and compliant management of generated wastes
- ensure worker and public safety
- ensure compliant management of chemicals.

4.4.2.1 Asbestos Characterization
The objective of the asbestos material characterization is to determine the type, quantity and location of asbestos containing building material (ACM). The characterization of the building will be conducted in several phases. These phases will correspond to the work areas identified by the overall building closure schedule. Work areas will be characterized prior to the disruption or removal of suspect materials.

Asbestos material characterization includes a review of documents detailing facility history, facility construction drawings, facility walkdowns, sample collection and analysis and evaluation and documentation of results and conclusions. The asbestos characterization survey will be designed and managed by a qualified individual per the requirements of 29 CFR 1926.1101. Samples will be collected at locations identified during the review of facility drawings and walkdowns. Surveys will be performed by trained individuals following written procedures. All samples will be tracked from sample collection, transport and analysis and all samples will be analyzed at a certified laboratory. Data will be recorded in an orderly and verifiable manner and will be reviewed by a

qualified Building Inspector for accuracy and consistency. A report will be prepared summarizing laboratory results including sample location, sample description, asbestos type and percentage, non-asbestos fiber types, matrix types and sample color.

4.4.2.2 Beryllium Characterization
Work areas and equipment where beryllium is known or suspected of being present will be surveyed prior to disruption or removal of such items or surfaces. Beryllium smears will be collected and analyzed from various equipment and equipment surfaces within the facility. Individuals trained in accordance with the RFETS Beryllium Control Program will conduct sampling plans and analysis.

4.4.2.3 Lead Characterization
Lead shielding and lead-based paint are known to be present in the facility. Accordingly all painted surfaces are presumed lead bearing unless proven otherwise. This approach will minimize characterization costs and ensure worker protection. Known lead will be disposed of appropriately and suspect lead will be sampled. Selected lead sampling will be conducted by collecting media samples for analysis and/or with portable lead detection equipment. Trained individuals using written procedures will conduct the sampling and analysis.

4.4.2.4 Polychlorinated Biphenyls (PCBs) Characterization
Polychlorinated biphenyl, also referred to as PCB, is a term given to a series of chemical compounds produced industrially by the chlorination of biphenyl with anhydrous chlorine and iron filings or ferric chloride as a catalyst. PCBs have been linked to liver damage and to a lesser degree, kidney damage. OSHA regulates human exposure levels to PCBS. OSHA guidelines will be implemented as appropriate to minimize worker exposure to PCBs. The primary occupational hazard associated with PCB's is skin exposure. Building 771/774 Industrial Hygiene and Safety will ensure that workers at risk of contact with PCB's will be adequately protected through engineering controls, administrative controls and personal protective equipment including PCB resistant gloves (example. Nitrile, Butyl, Viton). Other than the potential for PCBs in oil (contained in equipment or resulting from spills from equipment maintenance), adhesives and paints (in high temperature areas) and lighting ballasts, no additional contamination is suspected. In any event, OSHA guidelines will be implemented where PCBs are identified and the appropriate personal protective equipment (PPE) will be donned by workers. The 771/774 Closure Project will manage all materials <50ppm PCBs as non-Toxic Substance Control Act (TSCA) regulated.

4.5 General Closure Approach

This section provides. a general description of the sequential steps which will be followed to decommission rooms/areas within the 771[774 Closure Project. The detailed technical approach to decommission an area/room of the Closure Project will be developed and approved in accordance with the Integrated Work Control Process (IWCP). The IWCP contains detailed instructions for performing work on-Site and contains specific controls and requirements to ensure protection of the workers, public and environment. Provided in Appendix 5 is a flow chart of this process.

Following is a summary description and typical sequence of operations that will be employed during the closure of worksets within the 771/774 Closure Project. These activities will be controlled and authorized and may be modified as appropriate to address a specific condition or hazard in a particular workset.

- Additional radiological, chemical, industrial hygiene, environmental and safety characterization will be performed as necessary to prepare appropriate work authorization documents. This characterization process will be an ongoing process throughout the closure process to ensure the work area hazards are adequately quantified and proper personnel and environmental protection is provided.
- Training requirements are established in accordance with the Site Training Users Manual. Individual D&D worker training will be tracked and monitored using the training matrix in the HASP and in the List of Qualified Individuals.
- Prior to starting any activities all involved personnel will participate in a pre-evolution briefing to discuss the proposed work and to review the applicable safety requirements.
- If asbestos-containing materials will be disturbed as part of the scope of activity, the area will be abated by a qualified contractor prior to start of that work activity. The abatement activity will be carefully coordinated to minimize interference with other activities.
- Equipment and horizontal surfaces within a work area/room will be vacuumed and/or wiped down. Damp cloth and decontamination fluid and/or tack rags may be used. This housecleaning will be performed to minimize personnel exposure to potentially contaminated dust during subsequent decommissioning activities. This action would also remove any loose (asbestos, lead, beryllium) radiological contamination.
- Electrical power to components/systems to be removed will be de-energized and locked out/tagged out and disconnected. Electrical system conduit that cannot be de-energized or is required for continued closure activities will be clearly identified. Temporary power may be utilized and will be clearly identified and controlled.
- Temporary ventilation may be used as necessary.
- Piping systems and equipment will be drained, isolated and looked out/tagged out prior to any work on the system/equipment. All liquids collected will be appropriately sampled and managed/dispositioned in accordance with site waste management procedures.
- There are 38 liquid process systems currently being removed, many of the tanks associated with these systems are included in the Mixed Residue Tank Management Plan. All tanks have been drained to operationally empty and the liquids have been transferred and processed in Building 371. Currently, piping low points are being drained. Once the tanks and pipes are drained to physically empty, the piping will be removed. Closure Description Documents are being submitted for these systems as discussed in Section 4.6.1. Tanks will be removed later as part of the associated Decommissioning workset.
- Interconnecting system piping, conduit bracing and supports will be removed as necessary to remove equipment and components from the room.
- Equipment within the work area/room will be removed. As a general rule, equipment located at floor level will be removed first to allow better access to overhead areas. Equipment removal may include the disassembly and decontamination of the equipment if it is determined to be cost-effective or necessary to ensure safety. The decontamination efforts may be completed in place or the equipment/glovebox may be moved to another area for decontamination and size reduction. A variety of decontamination techniques may be used including a simple wipe down, use of abrasive material such as scotch brite, steel wool or sandpaper. More aggressive methods discussed in the DOE Decommissioning Handbook, (DOE/EM - 0142P) may be used if necessary. All equipment and components to be free

released will be surveyed in accordance with the RFETS Radiation Control Manual and associated implementing procedures prior to release.

Gloveboxes, B-Boxes and Hoods will be decommissioned using the following approach:

- Equipment and components will be removed from the internal portions of the contamination containment device (i.e., glovebox) as needed to facilitate waste packaging.
- Internal surfaces will be wiped down using tack rags, non-ionic clean solution, loose materials will be swept up as required. More aggressive techniques may be used such as abrasive grit blast or other methods discussed in the DOE Decommissioning Handbook.
- Based on radiological survey measurements, a strippable coating may be applied to fix surface contamination during size reduction- operations. When appropriate, the strippable coating may be applied and removed several times to reduce surface contamination levels.
- Prior to the size reduction of a glovebox, B-Box or hood, it will be enclosed in a contamination control containment. Depending on the layout of the room, the size of the component to be size reduced and radiological contamination levels, a 'containment may be erected around the equipment in place or the equipment may be moved to a semi-permanent size reduction facility located within Building 771, but in another room/area. One of the size reduction systems being proposed is a remotely operated device such as a robotic manipulator arm which will perform the size reduction. Building staff would move gloveboxes and tanks either whole or in-large sections into the containment. All cutting operations would then be performed remotely under programmed control or under operator control utilizing approved working procedures. Cut pieces would be bagged-out of the containment for assay and final packaging. In any case the contamination control containment will be equipped with HEPA ventilation to control the spread of contamination and minimize worker exposure during size reduction and waste packaging operations.
- Workers may size reduce the component using a variety of methods including nibblers, saws and other metal cutting techniques. Size reduction may be performed to minimize waste volume and allow packaging in approved containers. All waste material will be characterized and packaged in accordance with site Waste Management procedures as described in Section 6.0.
- After all equipment and systems have been removed from the room/area the exposed room surface will be radiologically decontaminated and abated for lead and/or PCBs in painted surfaces, as necessary. The surfaces will be sampled/surveyed to determine the need for further decontamination and to verify the effectiveness of the decontamination process. Room surfaces will typically be decontaminated by wipe down and/or surface scarification methods such as scabbling or other similar technique.

As the equipment and systems are cleared from each section of the building workers will complete the removal of all remaining utilities to the area. This will include the ventilation systems and all electrical power within the area. The section will then be sealed off until demolition of the building commences.

4.6 Regulatory Strategy

The 7711774 Closure Project will meet all applicable regulations and compliance agreements, including RFCA, the site RCRA permit, and the Residue Compliance Order #93-04-23-01.

4.6.1 RCRA Strategy

Appendix 6 provides a listing of the CHWA/RCRA units within the Building 7711774 Closure Project. Closure of permitted and interim status areas will be conducted in accordance with 6CCRI 007-3, Parts 264 or 265. The operating record of each RCRA unit will be reviewed to determine the hazardous wastes and the constituents relevant for closure performance. Closure Description Documents (CDD) are written to meet the requirements called out in the permit or Interim Status Unit Closure Plan; CDDs will be submitted to CDPHE as necessary, in accordance with the appropriate Closure Plan or this DOP. Specifically, the strategy to close the following categories of RCRA units is as follows:

For Mixed Residue tank systems - Piping will be removed in conjunction with the Process Piping Tap, Drain and Removal plan. The tanks will be left in place and removed subsequently with the associated Decommissioning workset. Tanks will be dismantled, sludges removed and dried if necessary, size-reduced as necessary and packaged for shipment/disposal.

For Rooms - RCRA waste will be removed. The units will be 'clean closed;" i.e., washed and certified clean or final closure may be deferred to decommissioning for that room.

For Gloveboxes - Material will be removed, the gloveboxes will be dismantled, size-reduced as necessary, and packaged for shipment/disposal.

If a RCRA closure is conducted pursuant to this DOP, the information that would be contained in the CDD will still be submitted to the LRA and the waste associated with that closure activity, with the exception of liquids and sludges, is remediation waste. Throughout the closure process, efforts may be made to bring each RCRA unit to a RCRA stable configuration, thus reducing inspections.

4.6.2 CERCLA Strategy through RFCA Compliance

4.6.2.1 Background

RFETS has implemented the CERCLA cleanup process using the RFCA. RFCA describes the process to undertake cleanup of the site through the facility disposition process. Due to the significant levels of contamination found within the 7711774 Closure Project, Buildings 7711774 are considered to be Type 3 facilities.

4.6.2.2 Transition to a CERCLA Regulated Facility
The 771/774 Closure Project will transition to a CERCLA facility during the closure process. This transition will occur after deactivation activities are completed within each area. For the purposes of RFCA, deactivation is a set of activities that occurs primarily in buildings that were used as part of the nuclear weapons production mission. RFCA does not regulate deactivation activities; instead, they are regulated pursuant to the Atomic Energy Act (AEA) and other applicable requirements and overseen by the DNFSB. The discussion included here is for the purpose of establishing the end of AEA deactivation and the beginning of RFCA decommissioning.

4.6.2.2.1 Deactivation Activities
Deactivation activities remove the duster of facilities from operation and prepare them for turnover- possibly to another contractor- for decommissioning or conversion/release to a new use meeting applicable safeguards, hazardous category or other completion criteria. Specific deactivation activities include: developing work summary plans, IWCP development, removal of hazardous and non-hazardous materials, holdup removal and emptying storage areas to reduce fire loading. Activities may include inventory and removal of unattached hazardous materials from the facilities and immediate areas, such as regulated hazardous chemicals, beryllium and gas cylinders. RCRA unit closures may be completed (waste generated in these closures would be process waste). An economic disposition determination shall be made for unneeded property. In general, minimal deactivation will be conducted in B771/774 since the intent is to decommission the facility as soon as possible.

Physical Deactivation activities reduce the potential liability and risks posed by excess contaminated equipment, RCRA issues and general hazards. The deactivation work included within Physical Deactivation also results in additional baseline costs reductions by eliminating or further reducing the surveillance and maintenance activities currently required. Other activities include the shipping of materials and waste in order to further deactivate areas within these facilities. It also may include removal of contaminated tooling that is easily removed and removal of clean equipment, tanks and gloveboxes that have never been integrated within the building systems and are free of contamination. Specific activities include:

- Empty storage cabinets;
- Reduce the fire load;
- Relocate classified tooling and parts;
- Prepare equipment for removal;
- Remove miscellaneous and equipment deemed excess;
- Remove tooling;
- Remove excess chemicals;
- Remove radiological check sources;
- Complete housekeeping cleanup;
- Release excess equipment and material to PU&D;
- Properly label contaminants prior to disposal;
- Remove hazardous chemicals and materials;
- Complete RCRA closure of units not required for Decommissioning;
- Identify and label contaminants prior to disposal;
- Package and stage waste for treatment, storage and/or disposal; and
- Deenergize and secure HVAC units not needed for decommissioning.

In general, completion of representative activities above would be the starting point for decommissioning work regulated by this DOP. Current deactivation activities include Tap & Drain and removal of liquid process piping and closure of Mixed Residue tanks. Activities such as waste chemical removal, disposition of excess property, chemical hazards reduction and placement of RCRA units into RCRA stable condition or their closure may occur either during deactivation or decommissioning.

4.6.2.2.2 Decommissioning Activities
The following list of examples of decommissioning activities should help delineate that portion of the disposition continuum that is regulated as decommissioning under RFCA and is therefore covered by this DOP:

- characterization of contamination
- hazards identification
- decontamination in preparation for release, reuse or dismantlement
- strip out and removal of gloveboxes, ducts and tank/process equipment
- size reduction of gloveboxes**,** ducts and tank/process equipment waste minimization activities associated with decommissioning
- dismantlement
- demolition

Before Decommissioning activities are conducted in accordance with this DOP, the DPP requires a readiness evaluation be conducted. The scope of this evaluation will be determined using the site's Activity Screening Process and the Readiness Determination Manual. The LRA may participate in the development and oversight of the readiness evaluation.

4.6.2.2.3 Waste Management Strategy
RFCA provides that process wastes and wastes generated during deactivation are CHWA/RCRA- regulated, whereas wastes generated during decommissioning are CERCLA-regulated (RFCA §§s 70-71). However, as described above, this project will be engaged simultaneously in deactivation and decommissioning. At such times, it may prove safer, more cost-effective and more expeditious from an operational stance, to manage the wastes generated from both activities in. the same manner. For example, if site personnel engaged in deactivation and decommissioning in different rooms of the same building are generating both process and remediation mixed transuranic wastes, the project manager may choose to store all such wastes in a single area and commingle such wastes in common containers. If this practice occurs, the wastes will be managed under CHWA/RCRA in I 20-day RCRA storage areas. However, in most cases, process wastes will be managed separately from remediation wastes. Section 6

contains more details. As discussed in section 4.6.1, waste generated from RCRA closures conducted under this DOP ran be managed as remediation waste with the exception of liquids and sludges.

A variety of means will be employed to enable the worker to ensure compliance with the correct regulation depending on the work being performed. Work authorization packages will be reviewed prior to the start of work to ensure that the waste will be property handled, segregated and categorized as appropriate. Additional methods of control may include administrative controls, such as identification of the activity and regulating agency on the work authorization package and physical controls, such as locking waste containers. At all times, process wastes will be managed to the current Federal, State and Local regulations, as mandated by current site procedures. Remediation wastes will be managed in accordance with Section 7, Applicable or Relevant and Appropriate Requirements (ARARs).

4.6.2.2.4 Documentation

4.6.2.2.4.1 Administrative Record File
The 771/774 Closure Project Administrative Record File (ARF) is comprised of documents that are considered to be relevant to the selection of this response action. This file will be maintained as an ARF until the remedial action is approved. A Site Technical Administrative Record Review meeting is held to, review the file for completeness and DOE then certifies completion of the file. Once the decision document is signed, the file becomes the Administrative Record for the 771/774 Closure Project.

The 771/774 Closure Project ARF was created in accordance with the applicable Site and Federal requirements. EPA, after consultation with CDPHE when necessary, makes the final determination of whether a document is appropriate for inclusion in an ARF. EPA and CDPHE participate in compiling the ARF by submitting documents to DOE RFFO as they deem appropriate. DOE RFFO forwards these documents to the RFETS ARF. The 771/774 Closure Project ARF will be reviewed and approved by DOE RFFO, EPA, and CDPHE before the file is closed at the signing of this DOP.

Four information repositories have been established to provide the public with access to the 771/774 Closure Project ARF. A copy of the 771/774 Closure Project ARF is accessible to the public at times other than RFETS normal business hours through the Public Reading Room at Front Range Community College.

Information Repositories:

U.S. Environmental Protection Agency
Region VIII
Superfund Records Center 999 18th Street,
Suite 500
Denver, Colorado 80202-2466
(303) 293-1807

Citizens Advisory Board
9035 Wadsworth Parkway
Suite 2250
Westminster, Colorado 80021
(303) 420-7855

Colorado Department of Public Health and Environment
Information Center, Bldg. A
4300 Cherry Creek Drive South
Denver, Colorado 80220-1530
(303) 592-3312

U.S. Department of Energy
Rocky Flats Public Reading Room
Front Range Community College Library
3 645 West 112th Avenue, Level B
Westminster, Colorado 80030
(303) 469-4435

4.6.2.2.4.2 Closeout Reports

Completion documentation will be compiled for each of the identified worksets. A final Closeout Report will be prepared for the 771/774 Closure Project when work is completed and the analytical data has been received. The report will consist of a brief description of the work that was completed, including any modifications or variations from the original decision document. The report will also include analytical results, including the results of any confirmatory sampling taken to verify completion of the action to the specific performance standards. A discussion of the quantity and characteristics of the actual wastes produced and how the wastes were stored or disposed will also be provided.

The report will state that the goals and objectives of the early action were met and if not, what additional work is required. The complexity of the Closeout Report and the level of detail will reflect the scope and duration of the action. The expected outline for the Closeout Report is shown below (although the format may change to meet the needs of the project).

- Introduction
- Remedial action description
- Verification that remedial action goals were met
- Verification of treatment process (if applicable)
- Radiological analysis (if applicable) Waste stream disposition

- Site reclamation
- Deviations from the decision document
- Demarcation of wastes left in place
- Dates and durations of specific activities (approximate)
- Final disposition of wastes (actual or anticipated)
- Lessons learned

4.7 Building Cleanup Criteria

The purpose of this section is to identify the cleanup criteria (acceptable level) which will be used to release the 7711774 Cluster facilities.

Radiological Release Criteria
The purpose of this section is to provide the radiological contamination cleanup criteria for the 771/774 Cluster. Section 4.4 Facility Characterization, Appendix 9, Set Description End Points and Hazard Matrix, and the RLCR for this project, identify the contaminants which are expected to be present at the start of decommissioning. The characterization information is used to ensure that workers are protected from the hazards in the work area, contamination is contained to protect the environs and the waste generated is properly and safely handled, packaged, labeled and moved.

In accordance with RFCA, the residual radiological contamination levels present on building structures, equipment and building debris remaining after decommissioning will meet an effective dose equivalent (EDE) of 15/85 mrem from the Site in any single year above background. Accepted industry standards for the release of materials are identified in "Radiation Protection of the Public and Environment", DOE Order 5400.5 as referenced in RFCA and *Termination of Operating Licenses for Nuclear Reactors,* NRC Regulatory Guide (RG)1.86, as referenced in *the Health and Safety Practice Transfer and Unrestricted Release of Property and Waste,* P73-HSP-1810 Appendix 1.

4.7.2 Equipment Unconditional Radiological Release Criteria

The unrestricted release of equipment to be removed from the site will comply with the RFETS Radiological Control Manual, the Health and Safety Plan (1-P73-HSP-1810, Appendix 1), DOE Order 5400.5, 'Radiation Protection of the Public and the Environment' (Figure IV-1), NRC RG 1.86 and applicable radiation protection implementing procedures. (For information, NRC RG 1.86 specifies the release criteria as less than 100 dpm/100 cm^2 . If 10CFR Part 834 is approved, all applicable practices and procedures will be reviewed and modified accordingly to ensure compliance. The RFETS Radiological Control Manual currently contains the most comprehensive table and includes all of the applicable RFETS radiological limits for the release of materials and equipment.

4.7.3 Beryllium Release Criteria

The beryllium release criteria and survey methods will conform to current RFETS policies and procedures. Building surfaces and equipment suspected o being contaminated with beryllium will be surveyed to assess the level of contamination. The surface contamination housekeeping limit for beryllium is 2µg/100 cm^2. Current RFETS practice for protecting personnel from beryllium is to utilize the ALARA (As Low As Reasonably Achievable) principle. This includes the use of engineering controls to minimize exposure, medical screening of personnel, and the reduction of limits and the proposed establishment of lower action levels. The limit for beryllium is currently being reviewed and a lower action level is being considered. The airborne action level for beryllium is 0.5 µg/m^2 . All personnel are trained in beryllium awareness and qualified industrial hygiene personnel perform all sampling for beryllium.

4.7.4 Asbestos Containing Materials (ACM) Release Criteria
Prior to and during the course of the closure project a comprehensive assessment and abatement program will be implemented in accordance with the OSHA Standard 1926.1101 and the site specific Heath and Safety Practices Manual. OSHA-qualified personnel will perform characterization, sampling/survey and abatement. An airborne room clearance level will be used for all areas in which asbestos abatement is conducted. The levels are as follows:

- 0.01fibers/cc utilizing the phase contrast microscope means of analytical technique
- 70 structures/mm utilizing the transmission electron microscopy technique

4.7.5 Polychlorinated Biphenyls (PCBs) Release Criteria

The 771/774 Cluster's building surfaces will be below the release limit for PCB contamination. The limit for release of PCB containing material is less than 50 parts per million (ppm).

4.8 Project Approach Summary

The 7711774 Closure Project will take a number of years to complete. As the work progresses there will be cases where circumstances are not as they were predicted. Therefore, rather than writing a document which will detail each step to be taken, this project has taken the approach of detailing the methodologies to be used, rather than explicit decisions. In doing so, it allows more work to be done in a shorter time, as work will not be delayed until the final planning is completed for all 82 worksets. Rather, as planning is completed for each workset, work will be allowed to progress in parallel with planning for future worksets. This process also allows the project to easily integrate lessons learned on prior worksets into the planning for future worksets.

All 82 worksets have been identified and prioritized. The criteria for workset identification and priority are located in Appendix 3. By utilizing this criteria the worksets were prioritized in an order that allows both work on multiple worksets as well as planning for needed staging areas within the facility.

Figure 4-2 details the overall methodology for closure. Within this approach, the facility is broken down into discrete worksets. These worksets, which consist of a room, a group of equipment, or a separate piece of equipment, are then given endpoints. From this point on, planning is done on a workset-by-workset basis. Using the endpoints, tasks are drafted for the activities to be performed. These tasks are evaluated based on costs and risks, in order to finalize the planned tasks. Based on the characterization needs identified in the RLCR, additional characterization is performed on the workset. Lessons learned from other worksets are evaluated to determine if the draft tasks need revision. Using the enhanced Work Planning process (see Section 5), a JHA is performed on the tasks to determine the appropriate controls to mitigate or eliminate risks. With this information a final approach for the workset will be determined. (Note: the flowsheet from a generic workset is provided in Appendix 5 for information.) The activity will be evaluated using the site's Activity Screening Process and the Readiness Determination Manual and a determination of readiness will be conducted if necessary. A roundtable review and verification/validation of the work package is performed. (The IWCP Manual requires these development steps.) Only after the completion of these preparatory actions will the tasks then be implemented. In the event that an unexpected situation is uncovered, the Site's procedure is to stop the evolution at that point, evaluate the hazard, determine appropriate protective measures and other actions necessary to proceed safely and in compliance with all rules and regulations and with these measures approved and in place, proceed with the activity. Key meetings and evolutions will be open to DOE and LRA representatives. Once established, the schedule for key meetings and evolutions will be provided to DOE and the LRA at their request. Copies of IWCP work packages and supporting documents will be made available to DOE and the LRA. DAILY reports are generated to summarize progress and problems encountered; the Daily Report includes each major work task currently underway. These reports will be provided to the LRA and DOE.

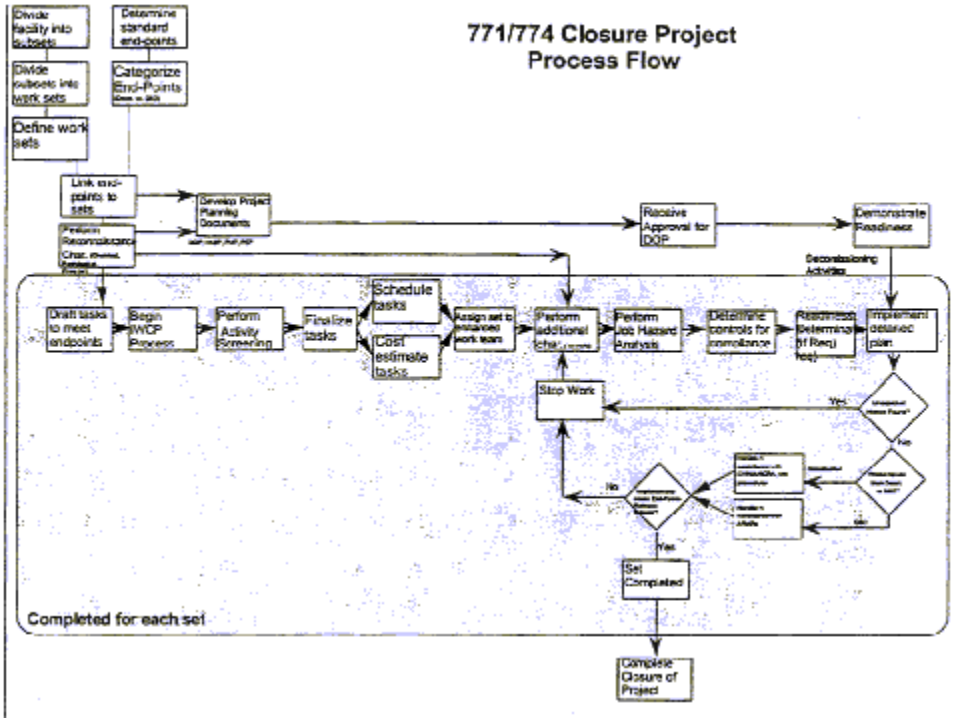

Figure 4-2 Project Approach Flowchart

All of the above work is governed by strategies that encompass the entire project. Details on these strategies are found in the sections listed below:

- Health & Safety (Section 5)
- Waste Management (Section 6)
- Compliance with ARARs (Section 7)
- Environmental Consequences of the Action (Section 8)
- Quality Assurance (Section 9)